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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/275,527	03/24/1999	DAVID KARCHMER	ALTRP049/A44	9876

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BEYER WEAVER & THOMAS LLP
P.O. BOX 778
BERKELEY, CA 94704-0778

EXAMINER

CRAIG, DWIN M

ART UNIT	PAPER NUMBER
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2123

12

DATE MAILED: 12/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/275,527

Applicant(s)

KARCHMER ET AL.

Examiner

Dwin M Craig

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8-28-2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2, 6-9, 11-14 and 26-28 is/are rejected.
- 7) ☒ Claim(s) 3-5, 10 and 15-25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 11.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-28 have been presented for reconsideration in view of Applicants Request for Continued Examination (RCE) under 37 CFR 1.114 and amended claim language.

Response to Arguments

2. Applicant's arguments filed on 28 August 2003 have been fully considered. Examiners response is as follows:

2.1 Regarding Applicant's response to the Examiners objection to the additon of drawings into the non-provisional instant application:

Applicant has argued that;

In paragraph 2, page 11 of the Final Action mailed June 5, 2003, the Examiner states that the "proposed drawing correction/and or the proposed substitute sheets of drawings filed on 19 May 1998 in the applicant's provisional U.S. Patent Application No. 60/086,153 have been disapproved because they introduce new matter into the drawings." The Applicant respectfully reminds the Examiner that provisional U.S. Patent Application No. 60/086,153 and the nonprovisional U.S. Patent Application No 09/275,527 are separate and distinct applications. Accordingly, when the non-provisional U.S. Patent Application No. 09/275,527 was originally filed on 24 March 1999, no amendment; to the drawings filed therewith were made. Therefore the Examiner's disapproval of the drawings based upon 37 CFR 1.121(a)(6) is unfounded.

The Examiner asserts that Applicant's arguments, in regards to provisional U.S. Patent Application 60/086,153 and the additional drawings are persuasive, and approve the additional drawings submitted by the applicant for the non-provisional application.

2.2 Regarding Applicant's response to the objection by the Examiner of the incorporation by reference of the paper entitled, "Assignment Decision Diagram for High-Level Synthesis" by Viraphol Chaoyakul and Daniel D. Gajski:

Applicant has argued that:

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At page 11, third paragraph of the Final Office Action, the Examiner states that incorporating by reference "Assignment Decision Diagram for High-Level Synthesis" by Viraphol Chaikyakul and Daniel D. Gajski, Technical Report #92-102, December 12, 1992 was improper due to the belief of the Examiner that the cited reference was essential matter. The Applicant, however, still disagrees with the Examiner on this issue since the Chaikyakul reference is subject matter illustrating the state of the art (see MPEP 608.01(p)(A)) and therefore its incorporation by reference is a matter of convenience for the reader.

The Examiner asserts that Applicant's arguments are persuasive and that the drawings and text in the provisional Application number 60/086,153 and the non-provisional Application number 09/275,527 are enabling for a Assignment Decision Diagram annotated with control nodes and that the paper entitled, "Assignment Decision Diagram for High-Level Synthesis" by Viraphol Chaoyakul and Daniel D. Gajski, is not essential material.

2.3 Regarding Applicant's response to the new matter objection to the Applicants non-provisional Application:

Applicants have argued that:

Also at page 12, first paragraph of the Final Office Action, the Examiner states that the "amendment to the specification, as compared to the priority document (provisional U.S. Patent Application No. 60/086,153 filed 24 March 1999)" is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure." The Applicant again respectfully reminds the Examiner that provisional U.S. Patent Application No. 60/086,153 and the non-provisional U.S. Patent Application No. 09/275,527 are separate and distinct applications and therefore a rejection under 35 U.S.C. 132 is improper. Since the applications are separate and distinct, the filing of the non-provisional U.S. Patent Application No. 09/275,527 on 24 March 1999 does not constitute adding new matter by amendment to the provisional application 60/086,153 and therefore cancellation of the new matter as requested by the Examiner is unwarranted.

The Examiner asserts that the Applicants arguments are persuasive and withdraws the earlier objection to the specification under 35 U.S.C. 132.

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2.4 Regarding Applicants response to the 35 U.S.C. 112 1st paragraph rejections of

Claims 1-28:

Applicants have argued that:

All claims were rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which is not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventor, at the time the application was filed, had possession of the claimed invention. The Applicant believes that the specification of the non-provisional U.S. Patent Application No. 09/275,52 properly provides support for all claims. The Examiner appears to be saying that the provisional U.S. Patent Application No. 60/086,153 does not provide support for claims 1 - 28 and therefore do not qualify for priority under 35 U.S.C. 119(e) and not, as recited in the Final Office Action, rejected as being unpatentable under 35 U.S.C. 112, first paragraph. Nonetheless, the Applicant believes that the provisional U.S. Patent Application No. 60/086,153 does provide sufficient support for claims 1 - 28 to qualify for priority under 35 U.S.C. 119(e) and that, the non-provisional U.S. Patent Application No. 09/275,527 properly provides support for claims 1 - 28. In any case, all of the cited references pre-date the filing date (19 May 1998) of the provisional application 60/086,153 and any questions of priority under U.S.C. 119(e) are moot.

A number of claims were rejected under 35 U.S.C. 112, second paragraph in that the term "substantially" is ambiguous. Accordingly, the claims so rejected have been amended in accordance with the Examiner's rejection and thus renders the 35 U.S.C. 112, second paragraph moot.

The Examiner asserts that the Applicant's arguments and amended claim language have been persuasive and the earlier 35 U.S.C. 112 1st rejections of Claims 1-28 are withdrawn.

2.5 Regarding the Applicants response to the 35 U.S.C. 103 rejections of Claims 1-

28:

Applicants have argued that:

Claims 1, 2, and 6 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,632,418 issued to Rostoker et al (*Rostoker*) in view of "Assignment Decision Diagram for High Level Synthesis" by Viraphol Chaikyul and Daniel D. Gajski (hereinafter *Chaikyul*) and further in view of U.S. Patent 5,920,711 issued to Seawrite et al (*Seawrite*). The *Rostoker* reference teaches a system for interactive design and simulation of an electronic circuit (at Abstract) which the Examiner admits at page 14 second paragraph does not disclose converting the hardware design code to an ADD nor

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does *Rostoker* disclose annotating the ADD (at page 14 last paragraph). In order to cure the admitted deficiencies in the primary reference *Rostoker*, the Examiner cited the secondary references *Chaiykul* and *Seawrite*, respectively.

Applicants have argued that the previous art rejections did not teach the claimed limitations. The Examiner has performed a new search, which has revealed new art references. The Examiner withdraws the earlier 35 U.S.C. 103(a) rejections of claims 1-28.

Applicant's arguments with respect to claims 1-28 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 101

3. Claims 7-10 and Claim 27 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

3.1 Claims 7-10 and Claim 27 recite a computer program product, i.e. a program on a recordable medium. It should be noted that code (i.e., a computer software program) does not do anything per se. Instead, it is the code stored on a recordable media that, *when executed*, instructs the computer to perform various functions.

3.2 The dependent claims **8-10** have inherited the flaw of independent **Claim 7** in regards to being directed to non-statutory subject matter.

3.3 From the MPEP: Chapter 700, Patentable Subject Matter—Computer-related Inventions:

Apart from the utility requirement of 35 U.S.C. 101, usefulness under the patent eligibility standard requires significant functionality to be present to satisfy the useful result aspect of the practical application requirement. See *Arrhythmia*, 958 F.2d at 1057, 22 USPQ2d at 1036. Merely claiming nonfunctional descriptive material stored in a computer-readable medium does not make the invention eligible for patenting. For example, a claim directed to a word processing file stored on a disk may satisfy the utility requirement of 35 U.S.C. 101 since the information stored may have some "real

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world" value. However, the mere fact that the claim may satisfy the utility requirement of 35 U.S.C. 101 does not mean that a useful result is achieved under the practical application requirement. The claimed invention as a whole must produce a "useful, concrete and tangible" result to have a practical application.

3.4 The following claim is a generic example of a proper computer program product claim;

A computer program product embodied on a computer-readable medium and comprising code that, when executed, causes a computer to perform the following:

Function A
Function B
Function C, etc...

3.5 For purposes of examination, claims 7-10 and 27 have been taken as including the "when executed" clause.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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4. **Claims 1-2, 6-9, 11-14 and 26-28** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Giomi U.S. Patent 5,744,370** in view of **“Condition Graphs for High-Quality Behavioral Synthesis”** by Hsiao-ping Jaun, Viraphol Chaiyakul and Daniel D. Gajski, hereafter referred to as the *Hsiao-ping et al.* reference.

4.1 As regards independent **Claims 1, 7, 11, 27 and 28** the *Giomi* reference discloses, hardware design code describing a process block (**Figure 3 Item 20, Col. 6 Lines 58-65**), converting the hardware design code describing the process block describing the process block to a control flow graph (**Figure 3 Item 20, Col. 5 Lines 49-67, Col. 6 Lines 1-22**), annotating the control flow graph of the process block with one or more control nodes (**Figure 416(A) note the block “CREATE NEW ‘IF₁’ NODE WITH LOOP CONDITION, Figure 21**), suitable for setting a state within the process block (**Figure 21, note the nodes in the state chart which say ‘ASIGN’**), wherein when a particular control node is encountered, a state within the process block associated with the control node can be directly observed thereby eliminating an atomic nature of the process block so as to provide a non-atomic analysis of the behavioral model, (**Col. 4 Lines 8-50**).

However, the *Giomi* reference does not expressly disclose converting the hardware design code describing the process block to an Assignment Decision Diagram (ADD).

The *Giomi* reference discloses that there is a need in the art to have an integrated tool, which can synthesize the hardware implementations of most if not all circuit behavior and with the least amount of restrictions on the modes of expressing that behavior (*Giomi, Col. 2 Lines 36-41*).

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An ordinary artisan would have been motivated to search the Behavioral Synthesis art for a better method of extracting implicit sequential behavior from hardware description languages, as suggested by the *Giomi* reference, in order to overcome the express deficiencies of the reference in regards to converting the hardware design code describing the process block to an Assignment Decision Diagram (ADD). In the related art of High-Quality Behavioral Synthesis, the *Hsiao-ping et al.* reference discloses converting the hardware design code describing the process block to an Assignment Decision Diagram (ADD), **(pages 170-174)**.

Thus, it would have been obvious, to one of ordinary skill in the art, at the time the invention was made, to have modified the control flow graphs of the *Giomi* reference with the Assignment Decision Diagrams of the *Hsiao-ping et al.* reference because, by using the Assignment Decision Diagram approach for high-level synthesis all possible mutual exclusive operators can be identified in a manner that out performs all previously known approaches **(*Hsiao-ping et al.* page 174, section 6 Conclusion)**.

4.2 As regards dependent **Claims 2, 8, 9, 12, 13 and 14** the *Giomi* reference does not expressly disclose the detailed workings of annotating an Assignment Decision Diagram.

The *Hsiao-ping et al.* reference discloses converting the hardware design code describing the process block to an Assignment Decision Diagram (ADD) and annotating an ADD, **(pages 170-174)**.

It would have been obvious, to one of ordinary skill in the art, at the time the invention was made, to have modified the control flow graphs of the *Giomi* reference with the Assignment Decision Diagrams of the *Hsiao-ping et al.* reference because, by using the Assignment Decision Diagram approach for high-level synthesis all possible mutual exclusive operators can be

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identified in a manner that out performs al previously known approaches (*Hsiao-ping et al. page 174, section 6 Conclusion*).

4.3 As regards dependent **Claims 6** the *Giomi* reference teaches Verilog and VHDL (Col. 6 Lines 22-45).

4.4 As regards dependent **Claim 26** "OFFICIAL NOTICE" simulation of Programmable Logic Devices are known in the simulation and Hardware Description Language art.

Allowable Subject Matter

5. **Claims 3-5 and 15-25** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. An updated search has revealed new art. **Claims 1-2, 6-9,11-14 and 26-28** have been rejected based on Applicant's amended claims. **Claims 3-5, 10 and 15-25** have been objected to for being dependent on rejected base claims.

6.1 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dwin M Craig whose telephone number is 703 305-7150. The examiner can normally be reached on 9:00 - 5:00 M-F.

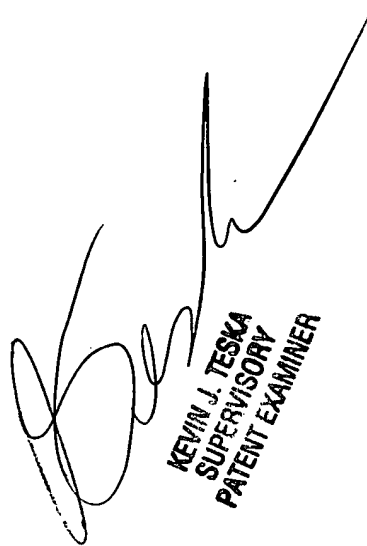
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska can be reached on 703 305-9704. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 305-3900.

DMC

December 13, 2003



KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER